

**Abstract**

Title: Polyethylene molding material and pipe produced therewith with improved mechanical properties

The invention relates to a polyethylene molding material having a bimodal molecular weight distribution which has an overall density of  $\geq 0.948 \text{ g/cm}^3$  and a melt flow index  $\text{MFI}_{190/5}$  of  $\leq 0.2 \text{ dg/min}$ . It comprises an amount of from 35 to 65% by weight of low-molecular-weight ethylene homopolymer A which has a viscosity number  $V_{NA}$  in the range from 40 to 90  $\text{cm}^3/\text{g}$ , a melt flow index  $\text{MFI}_{190/2.16 A}$  in the range from 40 to 2000  $\text{dg/min}$  and a density  $d_A$  of  $\geq 0.965 \text{ g/cm}^3$ , and an amount of from 35 to 65% by weight of high-molecular-weight ethylene copolymer B which has a viscosity number  $V_{NB}$  in the range from 500 to 2000  $\text{cm}^3/\text{g}$ , a melt flow index  $\text{MFI}_{190/5 B}$  in the range from 0.02 to 0.2  $\text{dg/min}$  and a density  $d_B$  in the range from 0.922 to 0.944  $\text{g/cm}^3$ . The fraction of the molding material according to the invention obtained during a preparative TREF analysis at a temperature of  $78^\circ\text{C} \pm 3 \text{ K}$  using p-xylene has an average molecular weight of  $\geq 200,000 \text{ g/mol}$ .

The invention also relates to a high-strength pipe produced from the molding material according to the invention which has a stress cracking resistance of  $\geq 1500 \text{ h}$ , a fracture toughness of  $\geq 9 \text{ mJ/mm}^2$  and a flexural creep modulus, measured in accordance with DIN 54852-Z4, of  $\geq 1350 \text{ N/mm}^2$ . It is particularly suitable for the transport of gases and water.